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EXAMINER

GOKHALE, SAMEER K

ART UNIT PAPER NUMBER

2629

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/750,140

Applicant(s)

NGUYEN ET AL.

Examiner

Sameer K. Gokhale

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-17 and 20-27 is/are rejected.
- 7) ☐ Claim(s) 4-5, 18-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 9-13 and 23-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 9-13, and 23-26, the phrase “a transformer having a first coil coupled between the second node and the fifth node” (on lines 9-10 of claim 1 and lines 9-10 of claim 23) renders the claims indefinite because it is not clear from the claims, specification, or the diagram how the first coil is between the second node and the fifth node (emphasis on figure 2).

Regarding claim 13 and 26, the phrase “in the burst mode, the first, second, third, and fourth switches are closed during a resting duration” renders the claims indefinite because it unclear whether the term “closed” is meant to indicate whether the switches are on or off because generally a closed switch is conducting and is on (Examiner notes that in the specification on page 7, line 25, the switches are referred to as “off” during a resting duration).

In light of the above rejections under 35 U.S.C. §112, the following rejections are based on the claims as best understood by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1-2, 6-7, 9-11, 13-14, 22-24, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US 6,936,975) in view of Esteves et al. (US 6,724, 174)(hereafter, "Esteves").

Regarding claims 1, 8, and 22 Lin teaches a method, apparatus and system comprising: a cold cathode florescent lamp (CCFL) (see Fig. 3A); an inverter component for a backlight or CCFL (Fig. 4 shows a standard voltage inverter circuit) , a controller for the inverter component (Fig. 4, the inverter controller), receiving an indicator of a brightness level for a backlight (see col. 4, lines 57-60, where there is voltage and current feedback to indicate the existing load which is also an indicator of the brightness level), said backlight having a voltage inverter (Fig. 5), and Lin further teaches operating in either a burst mode or continuous mode (see col. 4, lines 43-46). However, Lin does not explicitly teach selecting either a continuous mode of operation for the voltage inverter or a burst mode of operation for the voltage inverter based at least in part on the indicator.

However, Esteves does teach power supply regulator that selects either a continuous mode of operation for the voltage inverter or a burst mode of operation for

the voltage inverter based at least in part on the indicator (see col. 5, lines 4-29, where indicator of the load level is used to switch between a continuous or burst mode, and see col. 3, lines 29-30, where this method may be utilized in any regulator that uses burst mode operation).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Esteves in the circuit of Lin in order to provide higher efficiency and reduce transistor gate charge losses at light lamp loads.

Regarding claim 2, Esteves further teaches a method further comprising: comparing the brightness level to a threshold brightness level (see col. 6, lines 50-64, where the mode voltage, which corresponds to the existing load level, is compared to the threshold voltage V_{th}); if the brightness level is above the threshold brightness level, setting the indicator to indicate a high brightness level (see col. 6, lines 45-59, where a high level is indicated if the voltage is above the threshold); and if the brightness level is below the threshold brightness level, setting the indicator to indicate a low brightness level (see col. 6, lines 60-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the threshold of Esteves in the invention of Lin in view of Esteves in order to have an automatic method of switching between a continuous mode and a burst mode.

Regarding claim 6, Lin further teaches a method comprising: setting the brightness level for the backlight based on at least one of a user input and an operating system control (see col. 4, lines 62-64, where the inverter controller inherently corresponds to operating system control).

Regarding claim 7, Esteves further teaches a method wherein selecting either the continuous mode or the burst mode comprises: selecting the continuous mode if the indicator indicates a brightness level above a threshold (see col. 6, lines 45-59, where a high level is indicated if the voltage is above the threshold); and selecting the burst mode if the indicator indicates a brightness level below the threshold (see col. 6, lines 60-64).

Regarding claims 9 and 23, Lin further teaches an apparatus and system wherein the inverter component comprises: a first switch (Fig. 4, switch 34A) coupled between a first node and a second node (Fig. 4), said first node to couple to a voltage source (Fig. 4, the node above 34A is connected to a high voltage source H.V.); a second switch (Fig. 4, switch 36A) coupled between the second node and a third node (Fig. 4), said third node to couple to a ground (Fig. 4); a third switch (Fig. 4, switch 34B) coupled between the first node and a fourth node (Fig. 4); a fourth switch (Fig. 4, switch 36B) coupled between the third node and the fourth node (Fig. 4); a first capacitive element coupled between the second node and a fifth node (Fig. 4, the capacitor is between node A, which is the second node and the right side of the primary of the

transformer, which is the fifth node); a transformer having a first coil coupled between the second node and the fifth node (Fig. 4), and a second coil to couple a sixth node to a first terminal of the backlight (Fig. 4, the secondary side of the transformer couples a sixth node to a first terminal of the backlight); and a second capacitive element to couple the sixth node to a second terminal of the backlight (Fig. 4, the capacitor beside the LCD panel couples the sixth node from the secondary side of the transformer to a second terminal of the backlight).

Regarding claim 10, Lin further teaches an apparatus wherein the first, second, third, and fourth switches comprise field effect transistors (FETs) (Fig. 4, switches 34A, 36A, 34B, and 36B are shown as transistors).

Regarding claims 11 and 24, Lin further teaches an apparatus wherein the controller is to open and close the first, second, third, and fourth switches (Fig. 4).

Regarding claims 13 and 26, Lin further teaches an apparatus wherein, in the burst mode, the first, second, third, and fourth switches are turned off during a resting duration (see Fig. 4, where it is inherent that during a resting duration the switches must be turned off).

Regarding claim 14 and 27, Lin further teaches an apparatus wherein the controller comprises: an indicator pin to receive an indication of the brightness level of

the backlight (Fig. 4, and see col. 4, lines 58-61, where the feedback line to the inverter controller indicating the current lamp load is equivalent to an indicator pin on the controller).

5. Claims 3, 15-17, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Esteves and further in view of Weindorf (US 20020118182).

Regarding claim 3, Lin in view of Esteves teaches the limitations of claim 2 as discussed above, however it does not teach that the threshold brightness level comprises 60 candela per meter squared.

However, Weindorf does teach a display where a threshold brightness level comprises 60 candela per meter squared (see para. 66, where 60 NITS is given as an upper level for nighttime display luminance).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Weindorf in the method of Lin in view of Esteves in order to have a threshold level set at an upper level of a nighttime luminance range, which in turn corresponds to a range of values for when low power is required.

Regarding claims 15-17, 20-21, Lin in view of Esteves and Weindorf teaches the limitations of claims 1-3, and 6-7 as discussed above, and Weindorf further teaches

that a method for controlling a backlight can be implemented on a machine readable medium having stored thereon machine executable instructions (see para. 60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Weindorf in the method discussed in claims 1-3, and 6-7 above in order to have a software implementation of the method which is well-known in the art.

6. Claims 12 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Esteves and further in view of Yu (US 6,750,842).

Regarding claims 12 and 25, Lin in view of Esteves teaches the limitations of claims 9 and 23 as discussed above, however it does not explicitly teach that the first and fourth switches are switched in phase, the second and third switches are switched in phase, and the first and fourth switches are switched 180 degrees out of phase with the second and third switches.

However, Yu does teach a backlight control circuit for a full-bridge circuit first and fourth switches are switched in phase, the second and third switches are switched in phase, and the first and fourth switches are switched 180 degrees out of phase with the second and third switches (see Fig. 1 and Fig. 2, where VG1 and VG3 correspond to the first and fourth switches of the Lin circuit discussed above and are switched 180 degrees of VG2 and VG4 which correspond to the second and third switches of the Lin circuit).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention incorporate the teachings of Yu in the method of Lin in view of Esteves in order to achieve a standard and well-known continuous mode of operation in a full-bridge circuit (see Yu, col. 1, lines 31-51)

Allowable Subject Matter

7. Claims 4-5 and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Relative to dependent claims 4 and 18, the major difference between the teaching of the prior art of record (Lin, Estevez) and the instant invention is that the said prior art does not teach that the threshold brightness level corresponds to an intersection of an efficiency curve of the voltage inverter in the continuous mode and an efficiency curve of the voltage inverter in the burst mode.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hedrick (US 20040051691) teaches an adjustable backlight with a threshold for switching to a power-saving mode for low brightness levels. Hirakata et al. (US 20040051692) teaches a LCD with a voltage inverter. Rhoads (5,793,342) teaches a electroluminescent device that has both continuous and burst modes. Ogoro (US 20010013854) teaches a backlight for a display with a burst mode for reducing power consumption. Lin (US 20040155853) teaches a automatic backlight adjuster that has a threshold level for supplying power to the backlight.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sameer K. Gokhale whose telephone number is (571) 272-5553. The examiner can normally be reached on M-F 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SKG
August 20, 2006

Sameer Gokhale
Examiner
Art Unit 2629



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